TITLE OF THE ABSTRACT : Agreement between 4 commonly used tonometers and their relationship with CCT in patients with normal and high intraocular pressure

DEPARTMENT : OPTHALMOLOGY

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OBJECTIVES:

Our study looked forward to find the relative agreement between 4 commonly used tonometers ,namely Goldmann applanation tonometer(GAT),Tonopen,Dynamic contour tonometer(DCT), and non contact tonometer(NCT).We also aimed to find the influence of central corneal thickness(CCT) on the measurements made by all these tonometers.

METHODS:

Patients were selected from among those who came in our outpatient department ,given they fullfill our exclusion and inclusion criteria. Inclusion Criteria :

1. Patients more than 18 years of age.

2. Willingness to participate in the study

3. Normal IOP subjects: Patients with IOP 10 to 24 mm Hg

4. High IOP subjects: Patients with IOP > 24 mmHg

Exclusion Criteria:

1. Any corneal pathology, including corneal oedema which prevents accurate measurement of IOP using GAT and DCT.
2. Patients with corneal astigmatism more than 2 dioptre as assessed by retinoscopy, and in patients with hazy media as measured by keratometry readings.
3. Patients who have undergone any intraocular surgery within the last 6 weeks.
4. Patients who are cannot co-operate for IOP measurement due to posture-related or physical problems.
5. Patients with active inflammation such as conjunctivitis and uveitis

All subjects initially had a detailed check up including slit lamp examination,and fundus examination. The principal investigator performed all IOP measurements using , NCT,GAT, DCT and Tono-Pen in that order. While the IOP is being measured the readings were be checked and documented by an optometrist in order to prevent an intra observer bias. All measurement were taken in the above mentioned sequence giving atleast a 5 minute interval between each measurement. Two IOP readings were taken for each tonometer and averaged. One hour after the IOP measurements, CCT is measured using an ultrasound pachymeter by a single optometrist

RESULTS:

All the data were collected in a clinical proforma and analyzed.We analyzed 65 eyes with normal IOP,and 42 eyes with high IOP.Descriptive variables were analyzed using mean and standard deviation.Correlation between different tonometers were analyzed using Pearsons correlation and concordance correlation .Agreement between different tonometer was analysed

using limits of agreement and Bland –Altman plots were made to depict it.Our study showed a good correlation among all instruments especially in patients with normal IOP.In normal IOP group,the difference between GAT and NCT was minimum.Tonopen and NCT underestimated IOP and DCT overestimated IOP,in normal IOP group.In high IOP group all instruments varied a lot,and all threeinstruments underestimated GAT IOP.Regard to the influence of CCT on instruments GAT and NCT were found to be influenced by CCT.As the CCT increased GAT and tonopen IOP also increased.

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